August 10, 2004

To whom it may concern:

Grifform Innovations manufacturing facility, located in Glide, OR, has their production of solid surface showers certified/listed with the NAHB Research Center, Inc.

The NAHB Research Center's program for plastic plumbing fixtures is predicated on conformance to each of the nationally recognized model building codes including the Uniform Plumbing Code issued by International Association of Plumbing and Mechanical Officials. The program also conforms to the requirements of the Use of Materials Bulletin Number 73a issued by the Department of Housing and Urban Development.

The testing, listing, and certification program is characterized by periodic inspection of the manufacturing facility, review of quality control procedures as they relate to the finished product, random selection of product from the finished goods inventory, and testing in accordance with the ANSI Z124.2-1995 standard.

The NAHB Research Center understands the acceptance of listing agencies rests with the Administrative Authority. The Research Center has gone to great lengths to obtain accreditation enabling participants in the program to distribute product nationally. NAHB Research Center accreditations include, but are not limited to: Listing Agency for the State of California, Testing Agency for the International Association of Plumbing and Mechanical Officials, Certification and Testing Agency for the City of Los Angeles, and Compliance Assurance/Inspection Agency with the International Accreditation Service (IAS). Copies are attached.

The NAHB Research Center undergoes periodic independent audits by these agencies. These audits utilize ISO 17025 and ISO 17020, international standards for the operation of testing, calibration, and quality assurance agencies.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Charles Arnold
Project Manager

LABORATORY SERVICES

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PLASTIC SHOWER UNIT CERTIFICATION TEST RESULTS
FULL SERIES REPORT

Manufactured By: Grifform Innovations, Inc.
P.O. Box 258
Glide, OR 97443-0258

Manufacturer CR Number: 6532 **Report Number:** 65320603243

Date of Inspection: 6/14/2003 **Inspected By:** V. Daw
Date Unit Received: 8/11/2003 **Unit Model Style:** Custom
Date Unit Tested: 8/12/2003 **Unit Serial Number:** 091680000084
Date of Report: 8/19/2003 **Date of Manufacture:** 5/19/2003

Tests performed in accordance with ANSI Z124.2-1995-Plastic Shower Units

2.0 GENERAL REQUIREMENTS

2.1 Materials **Pass**
Reinforcement - Resin / Filler
Plastic - Resin
Fillers - Alumina Trihydrate
Substrate Pigments - Green Granite
Surface Finish - Solid Surface
Unit Characteristics - Solid Surface Square Shower

2.2 Dimensional Tolerances: 36" x 36" x 5 7/8" **Pass**
The unit's finished trim measurements shall be within tolerance of manufacturer's stated rough-in dimensions.

2.3 Unit for Testing **Pass**
Unit shall be randomly selected from manufacturer's finished goods inventory.

2.4 Installation Instructions **Pass**
Written installation instructions shall be affixed to the unit in a visible location.

2.5 Care and Maintenance Instructions **Pass**
Written care and maintenance instructions shall be affixed to the unit in a visible location.

2.6 Identification **Pass**
Manufacturer's name and/or trade mark shall be permanently and legibly marked on the unit in a visible location.

2.8 Raised Flange and Tiling Bead **Pass**
Units for installation against a wall shall incorporate a raised flange of not less than 1" above the rim at any point.

3.0 WORKMANSHIP AND FINISH

3.3 Surface Test **Pass**

Unit shall be free of cracks, chipped areas and blisters. The number of molding and other defects or blemishes shall not exceed those given in Table 1 of the referenced standard.

3.4 Subsurface Test **Pass**

No visual blemishes or voids larger than 1/16 of an inch in diameter shall be observed below the surface finish.

4.0 STRUCTURAL INTEGRITY

4.2 Drain Fitting Connection Test **Pass**

During and after the application of 50 pounds by using a 24 inch lever arm in three radial positions, no cracks shall be observed around the drain opening. During the load application in the three positions, no leaks shall be observed.

4.3 Point Impact Load Test **Pass**

After the impact of a 1 1/2 inch half-pound steel ball from a height of 36 inches and 24 inches, no cracks or chips shall be observed in any of the surface areas tested.

4.4 Bottom and Threshold Load Test **Pass**

Bottom Load

Measurements recorded under the applied loading of 300 pounds on three different bottom surface areas shall not exceed the maximum allowable deflection of 0.150 inches. After removal, the unit shall not exceed the maximum allowable residual deflection of 0.008 inches. No cracks shall be observed in the surface finish.

Position Number	Deflection (inches)	Residual Deflection (inches)
1	0.053	0.000
2	0.037	0.000
3	0.041	0.001

Rim Load

A 300 pound load shall be applied to the end and mid sections of the rim. No cracks shall be observed in the surface finish.

Rim Load
A = N
B = N

4.7 Radii Load Test **Pass**

Surface shall not show cracks, chips, or voids under the applied load of 10 pounds with a half-inch diameter nylon rod on the unit's radial surface areas.

5.0 PHYSICAL CHARACTERISTICS

5.1 Colorfastness Test **Pass**

The test sample shall show no significant change in color or surface texture after 200 hours of exposure to a xenon arc-type light-exposure apparatus in accordance with ASTM D2565.

5.2 Stain Resistance Test **Pass**

Ratings for removal of the seven stains listed in the referenced standard are as follows:

REAGENT	COVERED	UNCOVERED
1. Black crayon	2	2
2. Black liquid shoe polish	2	2
3. Blue washable ink	3	3
4. Gentian Violet solution	2	2
5. Lipstick	2	2
6. Hair dye	1	1
7. Iodine solution	1	1
TOTALS	13	13
Thickness of material lost = 0 inches	Stain resistance rating = 26	

The stain resistance rating shall not exceed 50. The maximum allowable thickness of material removal to eliminate the stain shall be 0.005 inches.

5.3 Wear & Cleanability Test

A. Wear **Pass**

The surface finish of the three test samples shall not wear through to the supporting subsurfaces after 10,000 scrub cycles with an abrasive slurry solution.

B. Cleanability **Pass**

The average absolute loss of white-light reflectance after application and removal of standard dirt with liquid detergent shall not exceed 5.0 percent. The average absolute loss of white-light reflectance after additional cleaning with an abrasive slurry solution shall not exceed 2.0 percent.

Loss after liquid detergent application = **1.0%**
Loss after abrasive slurry application = **.2%**

5.4 Cigarette Test **Pass**

After contact with three lighted cigarettes, the test sample shall show no ignition, progressive glow, or unrepairable damage. Damage to the surface shall be easily repairable by using abrasive and/or polishing compounds.

5.5 Chemical Resistance Test **Pass**

The surface finish shall be unaffected by the 13 reagents used. Any superficial surface change shall be easily repairable by using abrasive and/or polishing compounds.

5.6 Ignition Test **Pass**

After application of a 1 inch flame from a propane torch for 30 seconds, each of the five samples tested shall cease to burn within 30 seconds after removal of the torch.

Sample Number	Burning Period in Seconds Applications	
	1st	2nd
1	0	1
2	2	2
3	4	2
4	2	1
5	3	1

6.0 MATERIALS TESTING

6.1 Water Resistance Test **Pass**

There shall be no cracking, blistering or spalling observed at the conclusion of testing. The unit shall pass the ANSI requirement of 250 cycles.

6.2 Non-integral Flange Test **N/A**

Additional Requirements for Conformance to Model Building Codes:

- IPC – International Plumbing Code
- UPC - Uniform Plumbing Code

IPC 418 Dimensional Requirements

Waste outlets must be 2” diameter minimum . Finished interior must be greater than 900 square inches. Interior must encompass a 30" diameter circle. 32” x 32” showers are allowed provided an exterior base side measures not less than 31 1/2”.

Manufactured by:	Grifform Innovations, Inc. Glide, OR	Date of Inspection: 6/14/2003 Report #:65320603243

UPC 410 Dimensional Requirements

Interior must encompass a 30" diameter circle. Threshold must be at least 22" wide and 1" lower than sides and back. Sides must turned up at least 2" but not more than 9" as measured from the drain. Must have uniform slope greater than 1/4"/ft. but less than 1/2"/ft. Finished interior must be greater than 1024 square inches. All dimensions must be maintained to at least 70" above drain outlet. Unit must have an integral tiling flange.

Comments:

Shipping damage, if any, did not influence test results. The unit was inspected for tampering prior to arrival. These tests were performed under the direct and continuous supervision of laboratory personnel. The plastic shower, as selected, passed all of the sections of the ANSI Z124.2-1995 standard detailed in this report.

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Charles P. Arnold
Program Manager

NAHB Research Center, Inc., is accredited by the National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code 100104.

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